of the sombre picture drawn by the writer of the editorial—that is, at the invalidity of separating research from college teaching—one cannot do better than to read the article by Charles A. Fenten in the *Bulletin of the American Association of Professors* entitled "The sweet sad song of the devoted college teacher" [**46**, 361 (1960)].

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Keynes' Theories of Economics

In recent issues of *Science* considerable space has been given to a writer who has been consistently glorifying the policies being announced by the current administrators of the federal government. He has been praising the applications of Keynes' theories of economics being made by those administrators. Particularly he has been stressing the belief that these "cheery" theories will provide a remedy for the problems of unemployment in the United States.

In appraising this writer's reports, scientists may wish to consider the statement [*Science* **128**, 1610 (1958)] of Harvard's outstanding economist, the late Sumner Slichter, that ". . . technological research had developed sufficiently by 1937 to make Keynes' theory of employment obsolete on the day of its publication. . . ."

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Strontium-90 in Wheat Flour

An interesting possibility that a substantial fraction of strontium-90 contamination in wheat flour in 1960 arose from wind-blown soil particles adhering to the head of the wheat plant has been raised by Ichikawa, Abe, and Eto in their report in *Science* [**133**, 2017 (1961)]. This possibility does not seem consistent with their data.

They considered that the apparent direct absorption of strontium-90 into wheat flour in 1960, compared with that in 1959, was too large to be accounted for by current fallout, since the fallout rate while the wheat heads were exposed was only one-fifth of that during the comparable period in 1959. However, if their data on strontium-90

contents of wheat leaf, husk, and bran are treated in the same way as the data for wheat flour, it is seen that the direct absorption of strontium-90 into the leaf and bran is consistent with the decreased fallout rate, while absorption into the husk agrees with the result for flour. If absorption of strontium-90 from wind-blown soil particles is a factor, then the content in husk, bran, and flour should all have been affected in the same way.

These calculations require the questionable assumption that the fraction absorbed by the wheat plant is constant from year to year. The retention and subsequent absorption of fallout probably varies greatly with the time and intensity of rainfall in relation to the age of the plant.

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My associates and I find Menzel's criticism very important and instructive. Though the contribution of wind-blown soil particles to the strontium-90 content in plants and the physiological mechanism of the phenomenon are not yet clear, it seems that the contribution of the soil particles does not necessarily affect the various parts of the plant in the same way. For example, at the time of ear shooting, husk and bran have already completed most of their growth, but the tissue which will eventually become wheat flour does most of its growing after ear shooting. Therefore, it seems likely that the strontium-90 derived from a soil particle that has adhered to the ear can be effectively incorporated into the "flour" tissue during its growth, together with other nutrient minerals. After the increase in mass of the "flour" tissue and the subsequent death of the husk tissue, rainout activity and direct absorption of strontium-90 become dominant factors, affecting the bran much more than the "flour" tissue. Therefore, the contribution of soil particles to bran can be assumed to be much less than the contribution to flour. Of course this is a possible assumption, though the mechanism would be more complicated. The phenomenon should be investigated further.

The relationship between fallout activity and contamination levels in plants has been utilized for analyzing food-chain contamination due to fallout. Of course, the influence of the rainfall pattern and the growing stage of the plant should be taken into consideration for the analysis. But it seems possible to assume that the rate of direct absorption of current fallout activity from year to year does not vary so much, if the same crops, harvested in the same season, are used.

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Water Resources

A recent issue of *Science* [**134**, 658 (8 Sept. 1961)] carried a brief item, "Salt-free water," which states that an "economical method for converting sea water to fresh water would be immensely useful for this country, *which faces a water shortage in the decades ahead. . . .*" (italic mine). Appearing as it does in a scientific journal, this statement would seem to sanction the claims of the water-supply alarmists that the United States will run out of water within the next 40 years.

There is no disagreement over predictions of a steadily increasing use of water in the decades ahead, but the prophets of desiccation of our water resources imply that water used is water used up. A conservative estimate indicates that our net need for water will be about 117 billion gallons per day by A.D. 2000, or 18 percent of the supply likely to be available by that time on a sustained-yield basis. The Select Committee on National Water Resources published a figure of 156.3 billion gallons per day, based upon similar assumptions.

An increasing use of water means merely a greatly increased *reuse* of water. This reuse will require improved methods for in-plant recycling of water, and for treatment prior to final discharge to protect the interests of downstream users. Thus, the cost of water and of waste treatment will rise, but there will be nearly as much water available as there ever was.

Research on desalting ocean and brackish water is an important federal project, but it should be evaluated in proper perspective. An economical method for recovering fresh water from the ocean would be an undoubted boon to water-short areas, but it is illusory